

and outer tissues. No algal zone has been observed in *Macrozamia*, *Zamia*, *Ceratozamia*, and *Bowenia*, but nodules are produced containing *Bacillus radicumicola* and *Azotobacter*. The author states that the cycads are the only nodule-bearing plants known in which four organisms are in symbiotic relationship, namely, two nitrogen-fixing bacteria, an alga, and a cycad.—J. M. C.

Sexual reactions of mucors.—BLAKESLEE⁷ has been hybridizing mucors and has secured some interesting results. His (+) and (−) strains have become familiar, and he has shown that the majority of mucors are dioecious. In the experiments presented in this paper he has crossed hermaphroditic species with the sexual races of dioecious forms. It seems that some of these hermaphrodites are heterogamic, showing a constant difference in the size of their gametes, the larger one being presumably female and the smaller one male. A sexual reaction was obtained between the (+) strain of a dioecious mucor and the smaller gamete of the hermaphrodite; and conversely, a similar reaction between the (−) strain of the dioecious form and the larger gamete of the hermaphrodite. The conclusion is obvious that the (+) strain of dioecious mucors is female and the (−) strain male.—J. M. C.

Development of Pyronema.—BROWN⁸ has investigated a form of *Pyronema confluens*, which he calls var. *inigneum*, in which the trichogyne does not fuse with the antheridium. He finds also that the cultural conditions for the growth of the variety appear to differ from those for the normal form in that sterilization of the substratum is unnecessary. No fusion of nuclei was observed in the ascogonium or ascogenous hyphae, the only one occurring in the asci. The fact that a species and its variety differ from one another in the distinct occurrence of the sex act and its entire absence is a striking illustration of the relation between the dependent habit and the sexual apparatus.—J. M. C.

Myxomycetes of Wisconsin.—DEAN⁹ has published a descriptive list of the Myxomycetes of Wisconsin, 74 species having been identified, representing 28 genera. The relatively large genera are *Physarum* (10), *Diderma* (6), *Comatricha* (5), *Arcyria* (5), and *Trichia* (5). The descriptions are full and accompanied by critical notes.—J. M. C.

⁷ BLAKESLEE, A. F., Sexual reactions between hermaphroditic and dioecious mucors. Biol. Bull. 29:87-89. pls. 3. 1915.

⁸ BROWN, WILLIAM H., The development of *Pyronema confluens* var. *inigneum*. Amer. Jour. Bot. 2:289-297. 1915.

⁹ DEAN, ALLETTA F., The Myxomycetes of Wisconsin. Trans. Wisc. Acad. Sci. 17:1221-1299. 1914.